



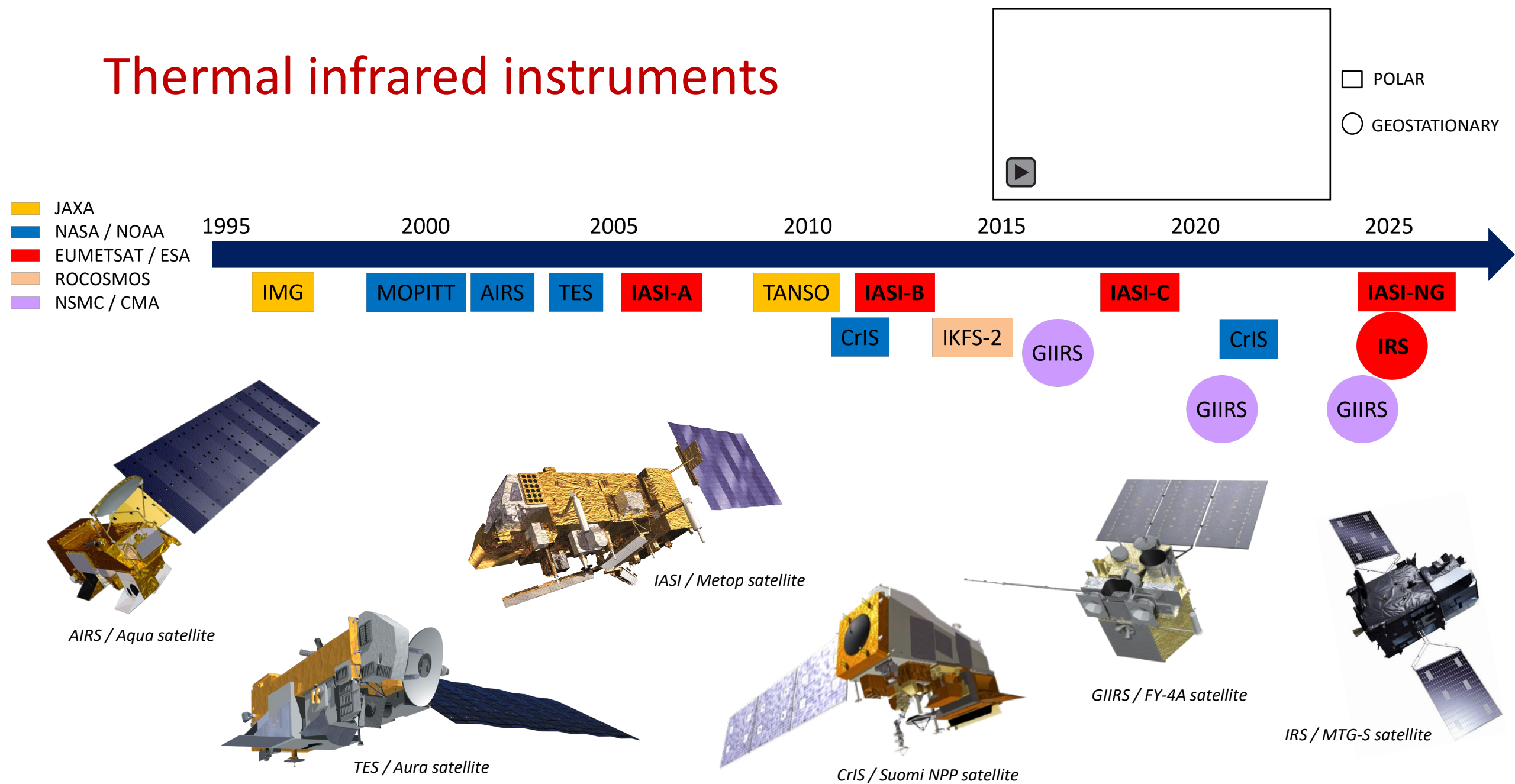
CEOS - AQ : IASI (CrIS, Mopitt)

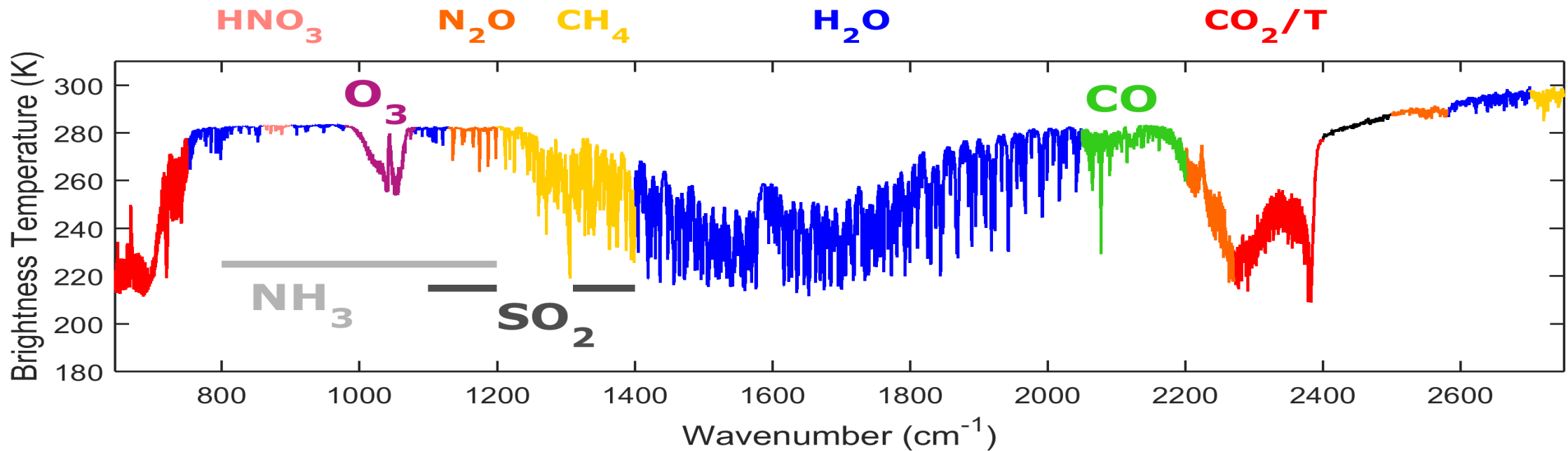
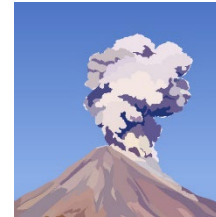
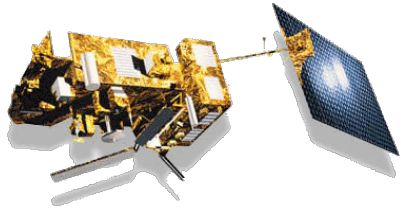
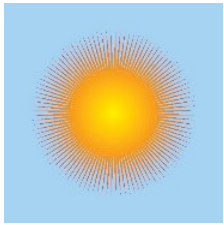
C. Clerbaux, et al.

LATMOS, IPSL, Sorbonne Université/UVSQ/CNRS, Paris, France

*Université Libre de Bruxelles (ULB), Spectroscopy, Quantum Chemistry
and Atmospheric Remote Sensing (SQUARES), Brussels, Belgium*

Thermal infrared instruments





Now 33 species
measured or *detected* by IASI

Greenhouse gases and ozone-related substances (13)

H_2O , CO_2 , CH_4 , N_2O , O_3 , HNO_3 , CFC-11, CFC-12, HCFC-22, CF_4 , SF_6 , CCl_4 , HFC-134a

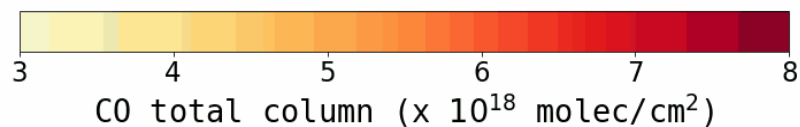
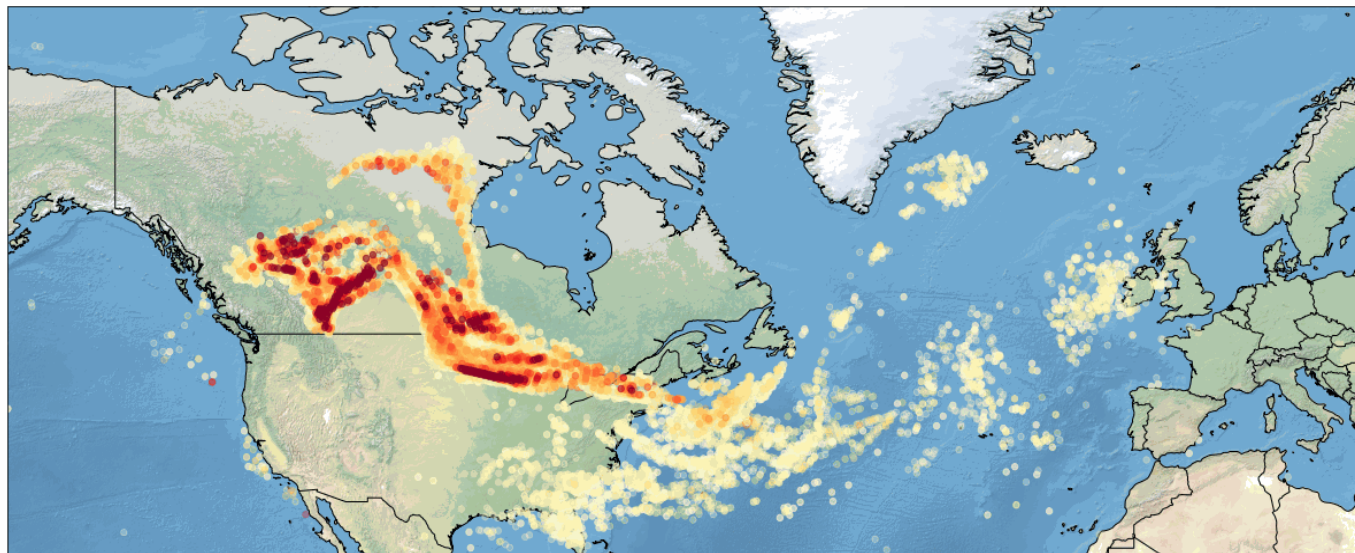
Air quality and VOCs (12)

CO , CH_3OH , HCOOH , CH_3COOH , CH_3COCH_3 , C_2H_2 , C_2H_4 , NH_3 , HCN , PAN, SO_2 , OCS

Concentrated plumes (6)

HCl , H_2S , C_3H_6 , $\text{C}_4\text{H}_4\text{O}$, HONO, HCHO

IASI/Metop B+C - 2023/05/16



scientific reports

[Explore content](#) [About the journal](#) [Publish with us](#)

[nature](#) > [scientific reports](#) > [articles](#) > [article](#)

Article | [Open access](#) | Published: 25 September 2023

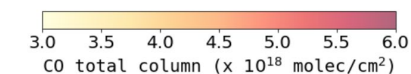
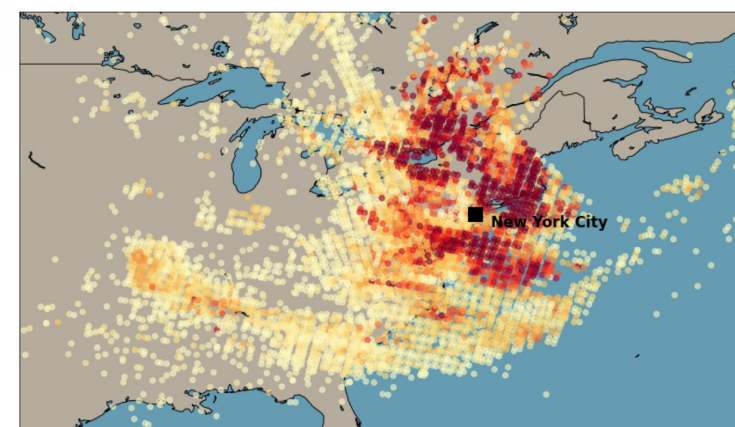
Remote sensing and model analysis of biomass burning smoke transported across the Atlantic during the 2020 Western US wildfire season

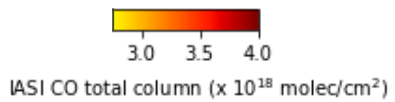
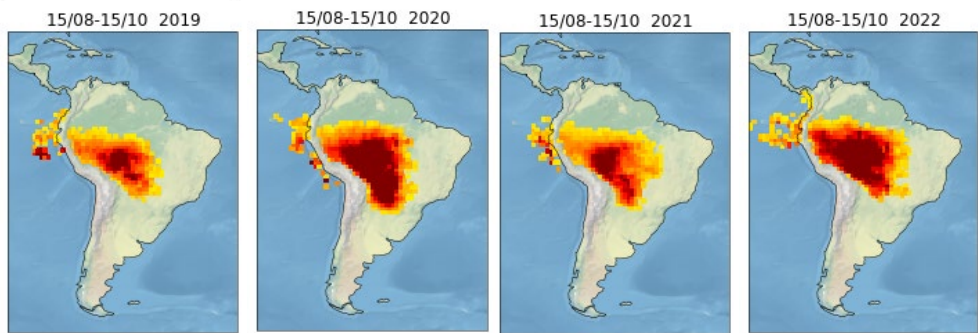
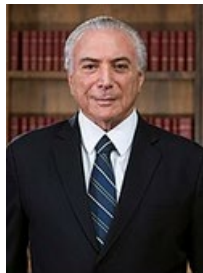
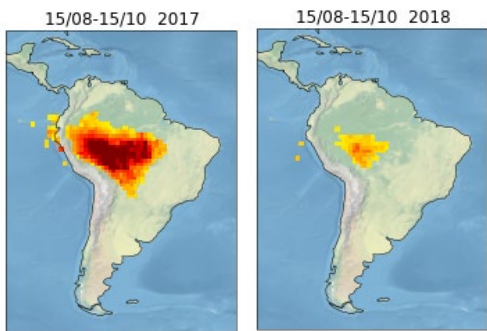
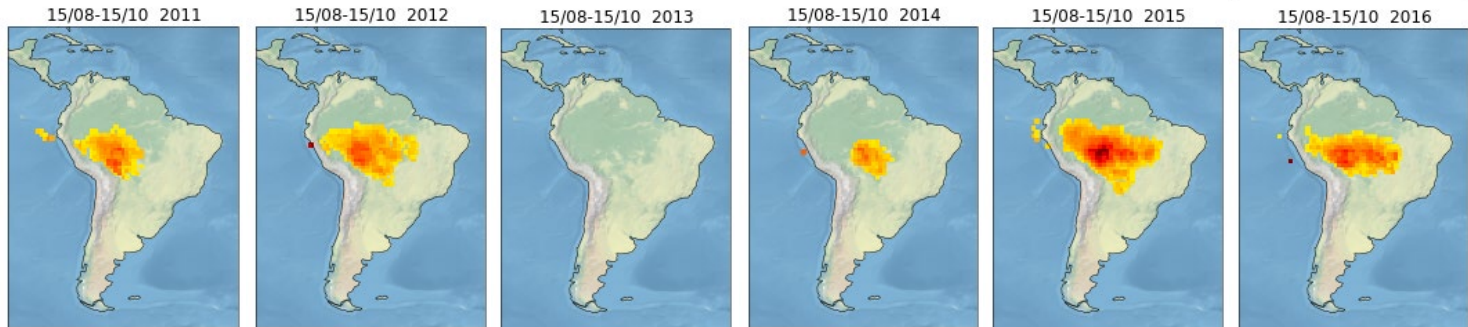
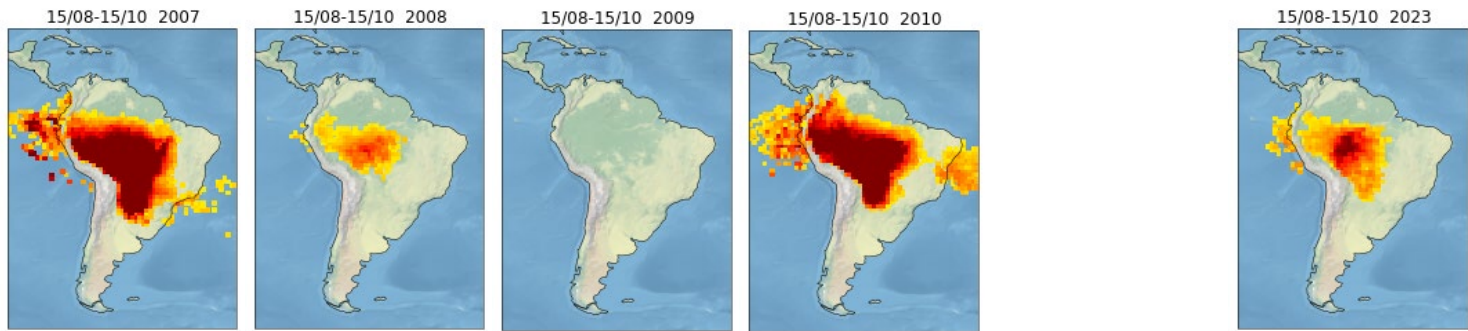
[Xavier Ceamanos](#) , [Quentin Coopman](#), [Maya George](#), [Jérôme Riedi](#), [Mark Parrington](#) & [Cathy Clerbaux](#)

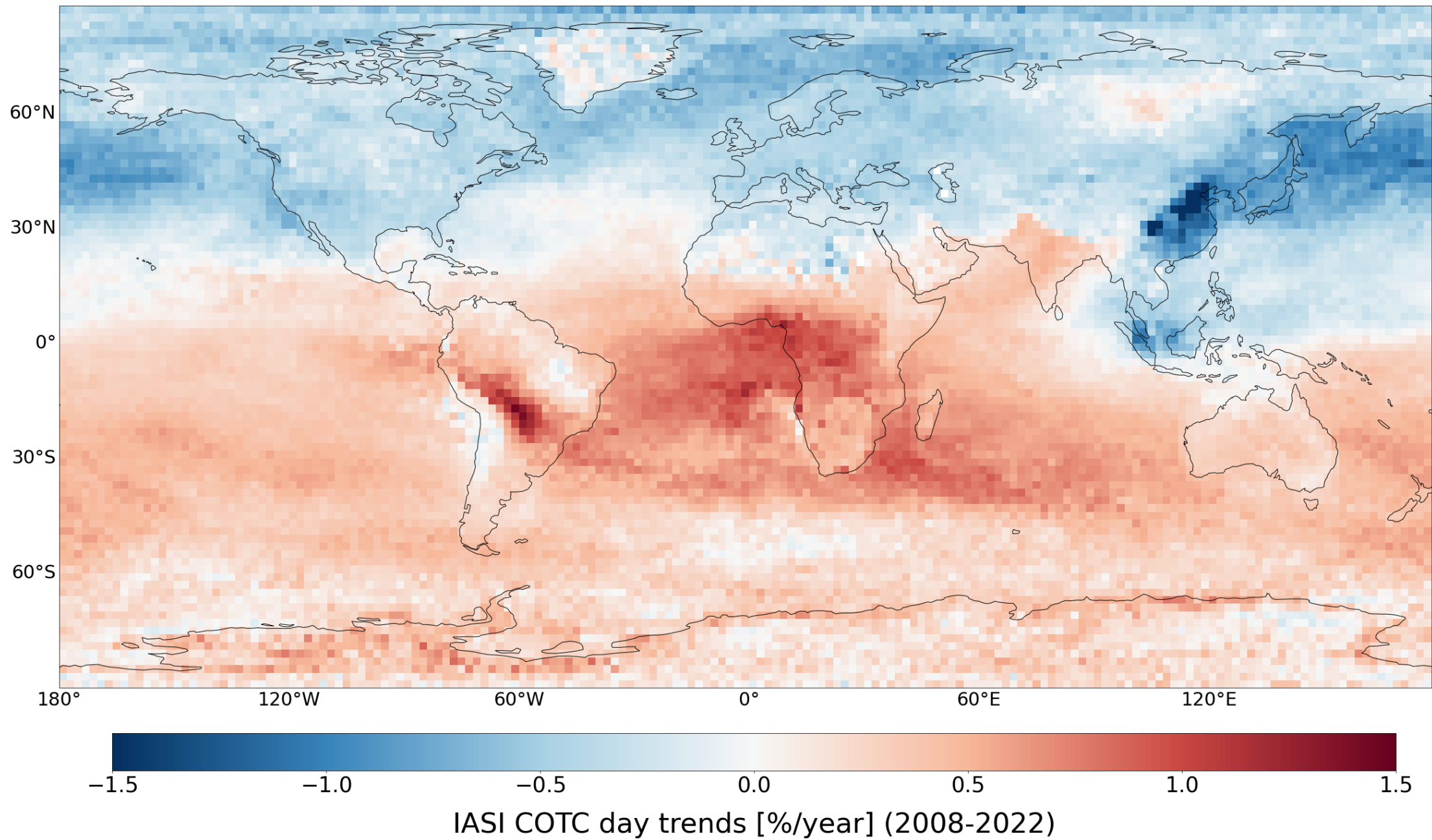
[Scientific Reports](#) **13**, Article number: 16014 (2023) | [Cite this article](#)

782 Accesses | 7 Altmetric | [Metrics](#)

IASI/Metop B+C - 2023/06/06







The IASI NH₃ version 4 product: averaging kernels and improved consistency

Lieven Clarisse¹, Bruno Franco¹, Martin Van Damme^{1,2}, Tommaso Di Gioacchino¹, Juliette Hadji-Lazaro³, Simon Whitburn¹, Lara Noppen¹, Daniel Hurtmans¹, Cathy Clerbaux^{3,1}, and Pierre Coheur¹

¹Université libre de Bruxelles (ULB), Spectroscopy, Quantum Chemistry and Atmospheric Remote Sensing, Brussels, Belgium

²Royal Belgian Institute for Space Aeronomy, Brussels, Belgium

³LATMOS/IPSL, Sorbonne Université, UVSQ, CNRS, Paris, France

Correspondence: Lieven Clarisse (Lieven.Clarisse@ulb.be)

Abstract. Satellite measurements play an increasingly important role in the study of atmospheric ammonia (NH₃). Here, we present version 4 of the Artificial Neural Network for IASI (ANNI) retrieval of NH₃. The main change is the introduction of total column averaging kernels (AVKs), which can be used to undo the effect of the vertical profile shape assumption of the retrieval. While the main equations can be matched term for term with analogous ones used in UV/Vis retrievals for other minor absorbers, we derive the formalism from the ground up, as its applicability to thermal infrared measurements is non-trivial. A large number of other smaller changes were introduced in ANNI v4, most of which improve the consistency of the measurements, across time and across the series of IASI instruments. This includes a more robust way of calculating the

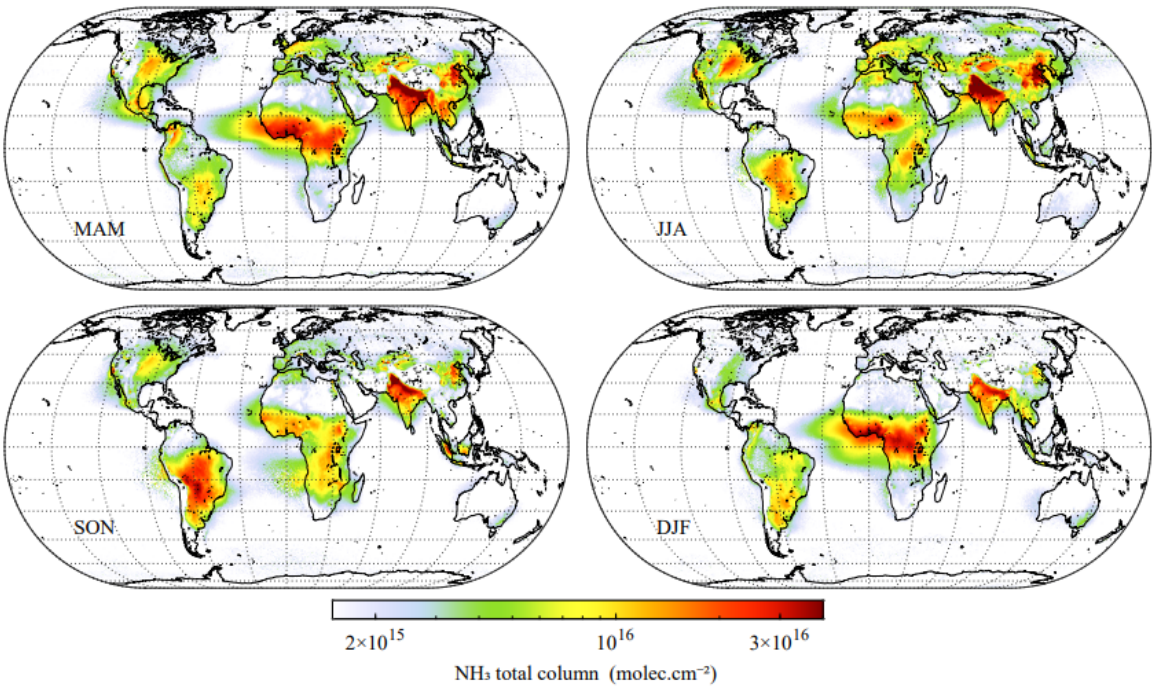


Figure 6. NH₃ seasonal average, derived from 0.5° × 0.5° monthly averages of the reanalysis product of ANNI v4. Data includes all measurements from IASI-A (October 2007 to December 2019), IASI-B (March 2013 to September 2022) and IASI-C (September 2019 to September 2022), with a cloud fraction below 10 %.

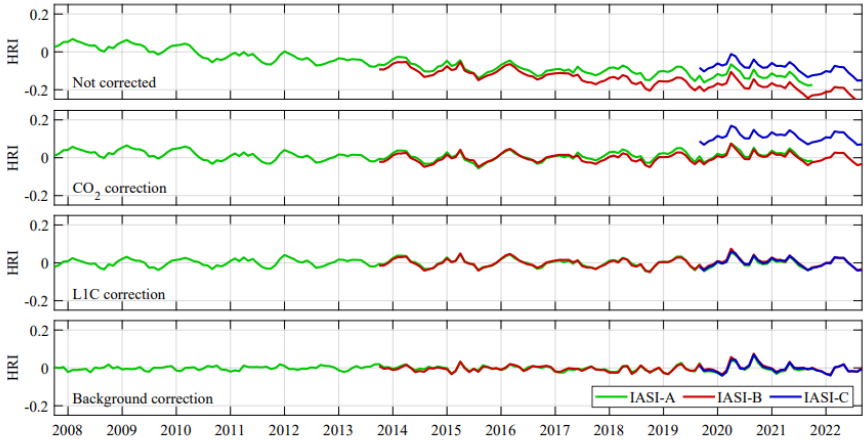


Figure 5. Monthly average HRI time series over 10 remote regions for the three IASI instruments separately. The top panel shows the uncorrected timeseries, and the other panels, from top to bottom, show the effects of the corrections that are applied consecutively.

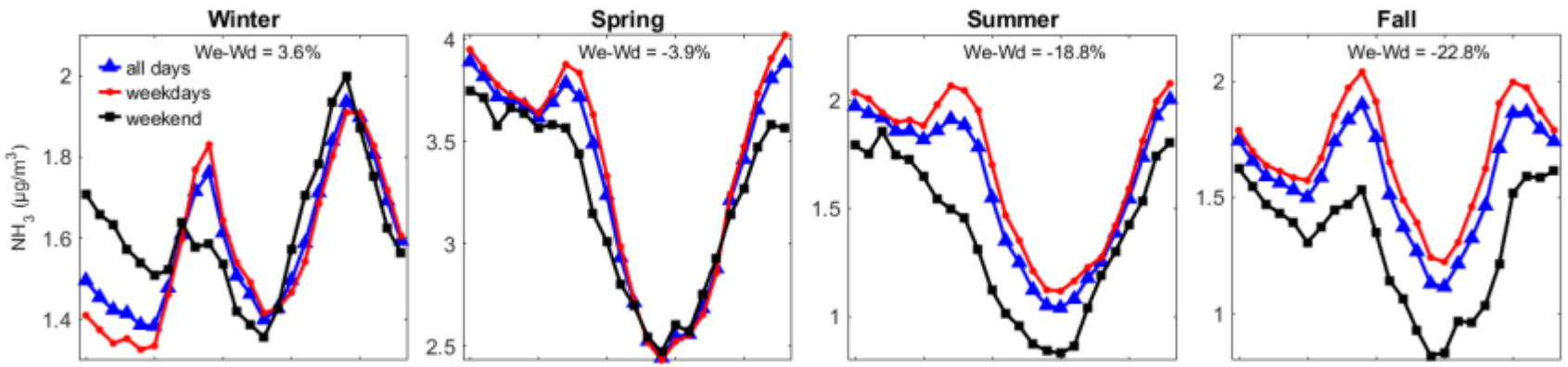
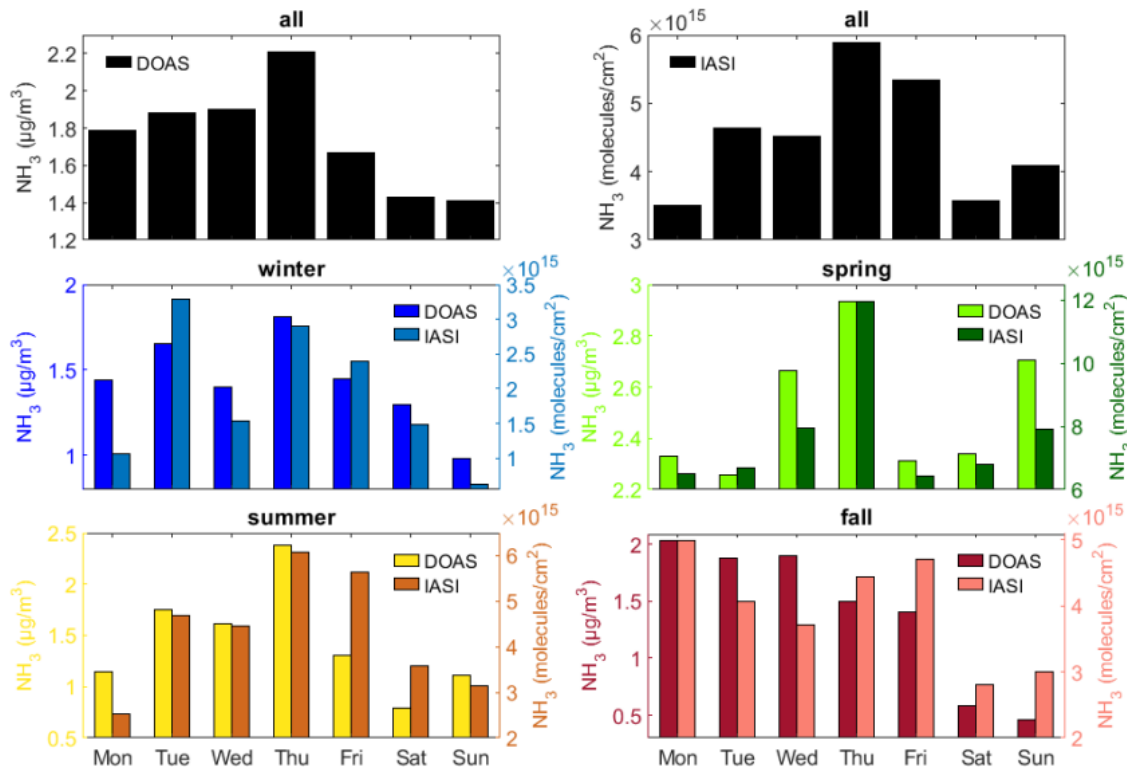


Measurement report: Ammonia in Paris derived from ground-based open-path and satellite observations

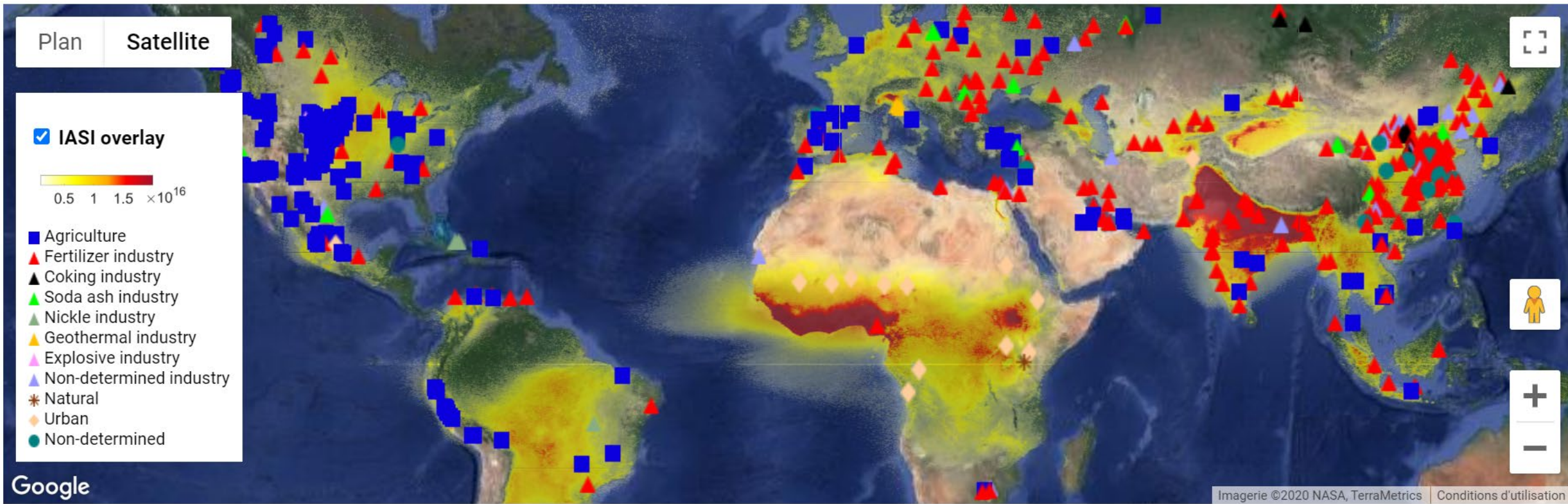
Camille Viatte¹, Nadir Guendouz¹, Clarisse Dufaux¹, Arjan Hensen², Daan Swart³, Martin Van Damme^{4,5},
Lieven Clarisse⁴, Pierre Coheur⁴, and Cathy Clerbaux^{1,4}

- ¹LATMOS/IPSL, Sorbonne Université, UVSQ, CNRS, Paris, France;
- ²Netherlands Organisation for Applied Scientific Research (TNO), P.O. Box 15, 1755 ZG, Petten, the Netherlands
- ³National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands;
- ⁴Université libre de Bruxelles (ULB), Spectroscopy, Quantum Chemistry and Atmospheric Remote Sensing (SQUARES), Brussels, Belgium;
- ⁵BIRA-IASB - Belgian Institute for Space Aeronomy, Brussels, Belgium;

Correspondence: Camille Viatte (camille.viatte@latmos.ipsl.fr)



Infrared retrievals – Ammonia (NH_3)



Global ammonia point sources as seen by IASI satellite instruments

<https://www2.ulb.ac.be/cpm/NH3-IASI.html>

Van Damme, M., Clarisse, L., Whitburn, S., Hadji-Lazaro, J., Hurtmans, D., Clerbaux, C., Coheur, P.-F. **Industrial and agricultural ammonia point sources exposed.** *Nature* **564**, 99-103, doi: [10.1038/s41586-018-0747-1](https://doi.org/10.1038/s41586-018-0747-1), 2018